



Complete Summary

GUIDELINE TITLE

Hantavirus pulmonary syndrome - United States: updated recommendations for risk reduction.

BIBLIOGRAPHIC SOURCE(S)

Centers for Disease Control and Prevention. Hantavirus pulmonary syndrome-- United States: updated recommendations for risk reduction. MMWR Recomm Rep 2002 Jul 26;51(RR-9):1-12. [46 references]

COMPLETE SUMMARY CONTENT

SCOPE
METHODOLOGY - including Rating Scheme and Cost Analysis
RECOMMENDATIONS
EVIDENCE SUPPORTING THE RECOMMENDATIONS
BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS
QUALIFYING STATEMENTS
IMPLEMENTATION OF THE GUIDELINE
INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT
CATEGORIES
IDENTIFYING INFORMATION AND AVAILABILITY

SCOPE

DISEASE/CONDITION(S)

Hantavirus pulmonary syndrome (HPS)

GUIDELINE CATEGORY

Prevention

CLINICAL SPECIALTY

Infectious Diseases
Internal Medicine
Preventive Medicine

INTENDED USERS

Patients
Physicians
Public Health Departments

GUIDELINE OBJECTIVE(S)

To provide updated recommendations for the prevention and control of hantavirus infections associated with rodents in the United States

TARGET POPULATION

Residents of the United States

INTERVENTIONS AND PRACTICES CONSIDERED

1. Measures to limit household exposures to rodents
 - Reduction of rodent shelter and food sources inside and outside the home
 - Rodent-proofing homes
2. Measures to limit occupational and recreational exposure to rodents
3. Cleanup of rodent-contaminated areas and dead rodents
4. Special precautions and measures for homes of persons with confirmed hantavirus infection or buildings with heavy rodent infestations, including recommendations for cleaning homes or buildings with heavy rodent infestations

MAJOR OUTCOMES CONSIDERED

Risk and incidence of hantavirus pulmonary syndrome (HPS)

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Precautions to Limit Household Exposure to Rodents

Rodent control in and around the home remains the primary strategy in preventing hantavirus infection. Rodent infestation can be determined by direct observation of animals, or inferred by observation of their nests or feces on floors or in protected areas (e.g., closets, kitchen cabinets, drawers, wall voids, furnace and hot water heating cabinets, and behind ventilation screens), or from evidence that rodents have been gnawing on food or other objects. The interior and exterior of the home should be carefully inspected at least twice per year for any openings where rodents could enter the home and for conditions that could support rodent activity. If any evidence of rodent infestation is detected inside the home or in outbuildings, precautions should be taken. The guidelines in the section Special Precautions for Homes of Persons with Confirmed Hantavirus Infection or Buildings with Heavy Rodent Infestations should be followed if a structure is associated with a confirmed case of hantavirus disease or if evidence of heavy rodent infestation is present (e.g., piles of feces or numerous nests or dead rodents).

Recommendations are listed below for 1) reducing rodent shelter and food sources inside and outside the home and 2) preventing rodents from entering the home by rodent-proofing.

Reduction of Rodent Shelter and Food Sources Inside and Outside the Home

Precautions for Inside the Home

- Keep food and water covered and stored in rodent-proof containers (a rodent-proof container is made of thick plastic, glass, or metal and has a tight-fitting lid).
- Keep pet food covered and stored in rodent-proof containers. Allow pets only enough food for each meal, then store or discard any remaining food. Do not leave excess pet food or water out overnight.
- If storing trash and food waste inside the home, do so in rodent-proof containers, and frequently clean the interiors and exteriors of the containers with soap and water.
- Wash dishes, pans, and cooking utensils immediately after use.
- Remove leftover food and clean up all spilled food from cooking and eating areas.
- Do not store empty aluminum cans or other opened containers with food residues inside the home.
- Dispose of trash and garbage on a frequent and regular basis, and pick up or eliminate clutter.
- Keep items (e.g., boxes, clothes, and blankets) off of the floor to prevent rodents from nesting in them.
- Repair water leaks and prevent condensation from forming on cold water pipes by insulating them. Deny rodents access to moisture (e.g., mop closets, boiler rooms, catch basins under potted plants, and areas around aquarium tanks). Correct any conditions that support the growth of mold, mildew, or other fungi in the home.
- Keep exterior doors and windows closed unless protected by tight-fitting screens.
- Use spring-loaded traps in the home. Use a small amount (the size of a pea) of chunky peanut butter as bait. Place the trap perpendicular to the baseboard or wall surface, with the end of the trap containing the bait closest to the baseboard or wall. Place traps in areas where rodents might be entering the home. (Note: Only spring-loaded traps that kill rodents should be used. Live and sticky traps that do not kill rodents are not recommended. Infectious aerosols might be produced when live rodents urinate or struggle to free themselves. Disposal of live rodents also introduces the risk of rodent bite, which also can result in infection.) Spring-loaded traps can be painful or even dangerous if they close on fingers; they should be handled with caution, and careful consideration should be given to keep children and pets away from areas where traps are placed.

In the western United States (west of the 100th meridian, a line from mid-Texas through mid-North Dakota), a risk of plague transmission to humans from fleas exists. Use insect repellent (containing N,N-diethyl-m-toluamide [DEET]) on clothing, shoes, and hands to reduce the risk of fleabites when picking up dead rodents and traps. In cases of heavy rodent infestation in indoor spaces in the

western United States, use an insecticide before trapping. Contact your local or state health department to find out if plague is a danger in the area and for additional advice on appropriate flea-control methods.

- Continue trapping for at least 1 additional week after the last rodent is caught. As a precaution against reinfestation, use several baited, spring-loaded traps inside the house at all times in locations where rodents are most likely to be found.
- Examine traps regularly. To dispose of traps or trapped animals, wear rubber, latex, vinyl, or nitrile gloves. Spray the dead rodent with a disinfectant or chlorine solution (see Precautions for Cleanup of Rodent-Contaminated Areas and Dead Rodents for detailed information regarding making a chlorine solution). After soaking the rodent thoroughly, either take it out of the trap by lifting the spring-loaded metal bar and letting the animal fall into a plastic bag or place the entire trap containing the dead rodent in a plastic bag and seal the bag. Then place the rodent into a second plastic bag and seal it. Dispose of the rodent in the double bag by 1) burying it in a 2-to 3-foot-deep hole or 2) burning it or 3) placing it in a covered trash can that is regularly emptied. Contact the state or local health department concerning other appropriate disposal methods (follow the recommendations specified in the section Precautions for Cleanup of Rodent-Contaminated Areas and Dead Rodents, if rodent urine, dropping, nests, or dead rodents are encountered while these measures are being carried out).
- If the trap will be reused, decontaminate it by immersing and washing it in a disinfectant or chlorine solution and rinsing afterward.
- For substantially severe or persistent infestations, contact a pest-control professional for rodent eradication or a building contractor for rodent exclusion (rodent-proofing).

When resident mice are removed from rural buildings without measures to prevent reentry, they are replaced almost immediately by other mice from the outside. Therefore, indoor rodent-trapping could be unsuccessful in reducing rodent infestations without simultaneous efforts to rodent-proof permeable dwellings.

Precautions for Outside the Home

- Place woodpiles and stacks of lumber, bricks, stones, or other materials ≥ 100 feet from the house.
- Store grains and animal feed in rodent-proof containers.
- Remove, from the vicinity of buildings, any food sources that might attract rodents.
- Keep pet food covered and stored in rodent-proof containers. Allow outside pets only enough food for each meal, then store or discard any remaining food from feeding dishes.
- Avoid using bird feeders near the home. If they must be placed near the home, use "squirrel-proof" feeders and clean up spilled seeds each evening.
- Dispose of garbage and trash in rodent-proof containers with tight-fitting lids.
- Haul away trash, abandoned vehicles, discarded tires, and other items that might serve as rodent nesting sites.

- Mow grass closely, and cut or remove brush and dense shrubbery to a distance of at least 100 feet from the home. Trim the limbs off any trees or shrubs that overhang or touch the building.
- Use raised cement foundations in new construction of sheds, barns, and outbuildings.
- Place spring-loaded traps in outbuildings (regardless of their distance from the home) and in areas that might likely serve as rodent shelter, within 100 feet around the home; use these traps continuously, replacing the bait periodically. For instructions concerning the safe use and cleaning of spring-loaded traps and the disposal of trapped rodents, see Precautions for Inside the Home (follow the recommendations specified in the section Precautions for Cleanup of Rodent-Contaminated Areas and Dead Rodents, if rodent urine, dropping, nests, or dead rodents are encountered while these measures are being carried out).

Preventing Rodents from Entering the Home by Rodent-Proofing

- Look for and seal up all gaps and holes inside and outside the home that are $\geq 1/4$ -inch (≥ 6 mm) in diameter. Inside the home, look for and seal up all gaps and holes underneath, behind, and inside kitchen cabinets; inside closets; around floor air vents and dryer vents; around the fireplace; around windows and doors; behind appliances (e.g., dishwashers, clothes washers, and stoves); around pipes under the kitchen and bathroom sinks; around all electrical, water, gas, and sewer lines (chases); and beneath or behind hot water heaters, radiators, and furnaces and around their pipes that enter the home. Outside the home, look for and seal up all gaps and holes around windows and doors; between the foundation of the home and the ground; under doors without weatherstripping; around electrical, water, gas, and sewer lines (chases); and around the roof, eaves, gables, and soffits. In addition, look for unscreened attic vents and crawlspace vents. In trailers, look for and seal up holes and gaps in the skirting, between the trim and metal siding, around utility lines and pipes and ducts, around roof vents, and around the trailer tongue.
- Seal all entry holes $\geq 1/4$ -inch (≥ 6 mm) in diameter that are inside and outside the home with any of the following: cement, lath screen or lath metal (a light-gauge metal mesh and is commonly installed over wood waller before plaster is applied), wire screening, hardware cloth ($< 1/4$ -inch grate size), or other patching materials. Steel wool or STUF-FIT (a soft copper-mesh material that might be preferable to steel wool because it does not rust and is not easily pulled apart by rodents) also can be used, but caulk must be placed around the steel wool or STUF-FIT to prevent rodents from pushing it through the hole. Caulk and expanding foam can be used to reinforce any repairs where lath metal, hardware cloth, steel wool, or STUF-FIT are the primary materials; however, caulk or expanding foam alone are usually not sufficient to prevent rodent intrusion.
- If rodent burrows are found under foundations or trailer skirtings, construct a barrier around the entire foundation using 14-inch wide (35 cm), $\leq 1/4$ -inch (≤ 6 mm) mesh, 16--19 gauge hardware cloth. Bend the hardware cloth lengthwise into a right angle with two sides of approximately 7 inches (18 cm). Secure one side of the hardware cloth tightly to the building siding. The other side should be buried at least 2 inches (5 cm) below ground level and extend out away from the wall.

- Consult a pest-control professional for severe or persistent infestations.

Precautions To Limit Occupational and Recreational Exposure to Rodents

Precautions for Workers Frequently Exposed to Rodents

Persons who frequently handle or are exposed to wild rodents are probably at higher risk for hantavirus infection than the general public because of the frequency of their exposures. Such persons include, but are not limited to, mammalogists, pest-control workers, some farm and domestic workers, and building and fire inspectors. Therefore, enhanced precautions are warranted to protect them against hantavirus infection, as described below.

- Workers in potentially high-risk settings should be informed by their employers about hantavirus transmission and symptoms of infection and be given detailed guidance on prevention measures. Determining the level of risk for hantavirus pulmonary syndrome (HPS) in each work setting is the responsibility of the employer.
- Employers should provide a comprehensive medical screening and surveillance program to workers, including medical clearance for respirator use, baseline evaluation, and periodic examination as indicated. The physician responsible for the program should be familiar with methods used for screening and early detection of infection in high-risk populations, as well as with the physical demands of the job and the medical requirements for use of personal protective equipment. On-call medical services should be provided, and workers should be able to contact these services for 45 days after the last potential exposure.
- Workers who develop a febrile or respiratory illness within 45 days of the last potential exposure should immediately seek medical attention and inform the attending physician of the potential occupational risk of hantavirus infection. The physician should contact local public health authorities promptly if hantavirus-associated illness is suspected. A blood sample should be obtained and forwarded to the state health department for hantavirus antibody testing.
- When removing rodents from traps or handling rodents, workers should wear either a half-face, tight-seal, negative-pressure respirator or a (positive pressure) PAPR (powered air-purifying respirator), equipped with N-100 or P-100 filters (formerly designated high-efficiency particulate air filters [HEPA]). Negative-pressure respirators are not protective if facial hair interferes with the face-piece to face seal because a proper fit cannot be assured. Respirator use practices in an occupational setting should be in accordance with Occupational Safety and Health Administration (OSHA) regulation 29 CFR 1910.134, which includes a written program specific to respirator use, risk assessment for personal protective equipment, medical clearance to wear respiratory protection, and annual training and fit testing in each approved respirator type. The comprehensive user program should be supervised by a knowledgeable person. Given the predictable nature of HPS risk in certain professions or environmental situations, provisions should be made in advance for respiratory protection. Because of the expense associated with purchasing a powered air-purifying respirator system, a negative-pressure tight-seal respirator equipped with N-100 or P-100 filters is recommended when respiratory protection is required for home use. Respirators might cause stress to persons with respiratory or cardiac conditions; these persons should

be medically cleared before using such a respirator. Home or other users with potentially impaired respiratory function also should be aware of the risks associated with the use of negative-pressure respirators.

- Workers should wear rubber, latex, vinyl, or nitrile gloves when handling rodents or handling traps containing rodents. Before removing the gloves, wash gloved hands in a disinfectant or chlorine solution and then wash bare hands in soap and water (follow the recommendations specified in the section Precautions for Cleanup of Rodent-Contaminated Areas and Dead Rodents, if rodent urine, dropping, nests, or dead rodents are encountered while these measures are being carried out).
- Mammalogists, wildlife biologists, or public health personnel who handle wild rodents for research or management purposes should refer to published safety guidelines. Precautions are also available on the Centers for Disease Control and Prevention's (CDC's) website, [All About Hantaviruses](#).

Precautions for Other Occupational Groups Having Potential Contact with Rodents

Insufficient information is available to provide general recommendations regarding risks and precautions for persons who work in occupations with unpredictable or incidental contact with rodents or their nesting sites. Examples of such occupations include telephone installers, maintenance workers, plumbers, electricians, and certain construction workers. Workers in these jobs might have to enter buildings, crawl spaces, or other sites that are potentially rodent-infested, and HPS has been reported among these workers. Recommendations for such circumstances must be made on a case-by-case basis after the specific working environment has been assessed and state or local health and labor officials or trade unions and management, as appropriate, have been consulted. Determining the level of risk present and implementing appropriate protective measures is the employer's responsibility.

Precautions for Campers and Hikers

No evidence exists to suggest that travel should be restricted in areas where HPS cases have occurred. The majority of typical tourist activities are associated with limited or no risk that travelers will be exposed to rodents or their excreta. However, persons engaged in outdoor activities (e.g., camping or hiking) should take precautions to reduce the likelihood of exposure to potentially infectious materials by following these recommendations.

- Avoid touching live or dead rodents or disturbing rodent burrows, dens, or nests.
- Do not use cabins or other enclosed shelters that are potentially rodent-infested until they have been appropriately cleaned and disinfected. (See Precautions for Cleanup of Rodent-Contaminated Areas and Dead Rodents.) Rodent-proofing might be necessary to prevent reinfestation. (See Precautions to Limit Household Exposure to Rodents.)
- When an unoccupied cabin or other structure to be used has been closed for several weeks, ventilate the structure by opening doors and windows for at least 30 minutes before occupying. Use cross ventilation if possible. Leave the area (preferably remaining upwind) during the airing-out period. The airing

helps to remove infectious primary aerosols that might be created when hantavirus-infected rodents urinate.

- Do not pitch tents or place sleeping bags in proximity to rodent feces or burrows or near possible rodent shelters (e.g., garbage dumps or woodpiles).
- Avoid sleeping on the bare ground. Use a cot with the sleeping surface at least 12 inches above the ground or use a tent with a floor.
- Keep food in rodent-proof containers.
- Dispose of all trash and garbage promptly in accordance with campsite regulations by
 - burning or burying,
 - discarding in rodent-proof trash containers, or
 - "packing out" in rodent-proof containers.

Precautions for Cleanup of Rodent-Contaminated Areas and Dead Rodents

Areas with evidence of rodent activity (e.g., dead rodents and rodent excreta) should be thoroughly cleaned to reduce the likelihood of exposure to hantavirus-infected materials. Cleanup procedures must be performed in a manner that limits the potential for dirt or dust from contaminated surfaces to become airborne. Recommendations are listed in this report for cleaning up 1) rodent urine and droppings, and surfaces potentially contaminated by rodents and 2) dead rodents and rodent nests.

Cleanup of Rodent Urine and Droppings and Contaminated Surfaces

- During cleaning, wear rubber, latex, vinyl, or nitrile gloves.
- Spray rodent urine and droppings with a disinfectant or chlorine solution until thoroughly soaked. (See Cleanup of Dead Rodents and Rodent Nests.)
- To avoid generating potentially infectious aerosols, do not vacuum or sweep rodent urine, droppings, or contaminated surfaces until they have been disinfected.
- Use a paper towel to pick up the urine and droppings. Place the paper towel in the garbage.
- After the rodent droppings and urine have been removed, disinfect items that might have been contaminated by rodents or their urine and droppings.
 - Mop floors with a disinfectant or chlorine solution.
 - Disinfect countertops, cabinets, drawers, and other durable surfaces with a disinfectant or chlorine solution.
 - Spray dirt floors with a disinfectant or chlorine solution.
 - Disinfect carpets with a disinfectant or with a commercial-grade steam cleaner or shampoo.
 - Steam-clean or shampoo rugs and upholstered furniture.
 - Launder potentially contaminated bedding and clothing with hot water and detergent. Use rubber, latex, vinyl, or nitrile gloves when handling contaminated laundry. Machine-dry laundry on a high setting or hang it to air dry in the sun.
 - Leave books, papers, and other items that cannot be cleaned with a liquid disinfectant or thrown away, outdoors in the sunlight for several hours, or in an indoor area free of rodents for approximately 1 week before cleanup. After that time, the virus should no longer be infectious. Wear rubber, latex, vinyl, or nitrile gloves and wipe the items with a cloth moistened with disinfectant.

- Disinfect gloves before removing them with disinfectant or soap and water. After removing the clean gloves, thoroughly wash bare hands with soap and warm water.

Cleanup of Dead Rodents and Rodent Nests

- Wear rubber, latex, vinyl, or nitrile gloves.
- In the western United States, use insect repellent (containing N,N-diethyl-m-toluamide [DEET]) on clothing, shoes, and hands to reduce the risk of fleabites that might transmit plague.
- Spray dead rodents and rodent nests with a disinfectant or a chlorine solution, soaking them thoroughly.
- Place the dead rodent or nest in a plastic bag or remove the dead rodent from the trap and place it in a plastic bag (See Precautions for Inside the Home.) When cleanup is complete (or when the bag is full), seal the bag, place it into a second plastic bag, and seal the second bag. Dispose of the material in the double bag by 1) burying it in a 2- to 3-foot-deep hole or 2) burning it or 3) discarding it in a covered trash can that is regularly emptied. Contact the local or state health department concerning other appropriate disposal methods.
- Clean up the surrounding area as described in Cleanup of Rodent Urine and Droppings and Contaminated Surfaces.

Disinfecting Solutions

Two types of disinfecting solutions are recommended to clean up rodent materials.

1. General-Purpose Household Disinfectant --- Prepare according to the label, if not prediluted. Almost any agent commercially available in the United States is sufficient as long as the label states that it is a disinfectant. Effective agents include those based on phenols, quaternary ammonium compounds, and hypochlorite.
2. Hypochlorite Solution --- A chlorine solution, freshly prepared by mixing 1½ cups of household bleach in 1 gallon of water (or a 1:10 solution) can be used in place of a commercial disinfectant. When using chlorine solution, avoid spilling the mixture on clothing or other items that might be damaged by bleach. Wear rubber, latex, vinyl, or nitrile gloves when preparing and using chlorine solutions. Chlorine solutions should be prepared fresh daily.

Cleaning Sheds and Other Outbuildings

Before cleaning closed sheds and other outbuildings, ventilate the building by opening doors and windows for at least 30 minutes. Use cross ventilation if possible. Leave the area during the airing-out period. This airing helps to remove infectious primary aerosols that might be created when hantavirus-infected rodents urinate. In substantially dirty or dusty environments, additional protective clothing or equipment may be worn. Such equipment includes coveralls (disposable when possible) and safety glasses or goggles, in addition to rubber, latex, vinyl, or nitrile gloves. For recommendations regarding precautions for cleanup of outbuildings with heavy rodent infestations, see Special Precautions for Homes of Persons with Confirmed Hantavirus Infection or Building with Heavy Rodent Infestations.

Special Precautions for Homes of Persons with Confirmed Hantavirus Infection or Buildings with Heavy Rodent Infestations

Special precautions are indicated for cleaning homes or buildings with heavy rodent infestations. A rodent infestation is considered heavy if piles of feces or numerous nests or dead rodents are observed. Persons cleaning these homes or buildings should contact the local or state public health agency or the Centers for Disease Control and Prevention for guidance. These precautions also can apply to vacant dwellings that have attracted rodents while unoccupied and to dwellings and other structures that have been occupied by persons with confirmed hantavirus infection. Workers who are either hired specifically to perform the cleanup or asked to do so as part of their work activities should receive a thorough orientation from the responsible health agency or employer about hantavirus transmission and disease symptoms and should be trained to perform the required activities safely.

Recommendations for Cleaning Homes or Buildings with Heavy Rodent Infestations

- If the building has been closed and unoccupied for a long period (weeks or months), ventilate the building by opening doors and windows for at least 30 minutes before beginning any work. Use cross ventilation if possible. Leave the area during the airing-out period. The ventilation helps to remove aerosolized virus inside the structure.
- Persons involved in the cleanup should wear coveralls (disposable if possible); rubber boots or disposable shoe covers; rubber, latex, vinyl, or nitrile gloves; protective goggles; and an appropriate respiratory protection device as detailed in Precautions to Limit Occupational and Recreational Exposure to Rodents.
- Personal protective gear should be decontaminated or safely disposed of upon removal at the end of the day. If the coveralls are not disposable, they should be laundered on-site. If no laundry facilities are available, the coveralls should be immersed in liquid disinfectant until they can be washed.
- Unless burned on-site, all potentially infectious waste material from cleanup operations should be double-bagged in appropriate plastic bags. The material in the bags should then be labeled as infectious and disposed of in accordance with local regulations for infectious waste.
- Persons involved in the cleanup who develop a febrile or respiratory illness within 45 days of the last potential exposure should immediately seek medical attention and inform the attending physician of the potential occupational risk of hantavirus infection. The physician should contact local health authorities promptly if hantavirus-associated illness is suspected. A blood sample should be obtained and forwarded through the state health department for hantavirus antibody testing.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is not specifically stated for each recommendation.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Reduction in risk and incidence of hantavirus pulmonary syndrome (HPS)

Subgroups Most Likely to Benefit:

Residents of the United States who live in geographic areas associated with heavy rodent infestations, higher risk or incidence of hantavirus infection

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

The control and prevention recommendations in this report represent general measures to minimize the likelihood of human exposure to hantavirus-infected rodents in the Americas. Although different geographic areas might have varying housing types and rodent populations, the precautions should be the same. The effect and utility of the recommendations will be continually reviewed by the Centers for Disease Control and Prevention (CDC) and the involved state and local health agencies as additional epidemiologic, field, and laboratory data become available. These recommendations might be supplemented or modified in the future.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Staying Healthy

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Centers for Disease Control and Prevention. Hantavirus pulmonary syndrome--United States: updated recommendations for risk reduction. MMWR Recomm Rep 2002 Jul 26;51(RR-9):1-12. [46 references]

ADAPTATION

This update is based on interim recommendations from James E. Childs, Sc.D.; Arnold F. Kaufmann, D.V.M.; and Clarence J. Peters, M.D., NCID; and Richard L. Ehrenberg, M.D., National Institute for Occupational Safety and Health.

DATE RELEASED

1993 (revised 2002 Jul 26)

GUIDELINE DEVELOPER(S)

Centers for Disease Control and Prevention - Federal Government Agency [U.S.]

SOURCE(S) OF FUNDING

United States Government

GUIDELINE COMMITTEE

Not stated

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

The effect and utility of these recommendations will be continually reviewed by the Centers for Disease Control and Prevention (CDC) and the involved state and local health agencies as additional epidemiologic, field, and laboratory data become available. These recommendations might be supplemented or modified in the future.

These recommendations and additional information concerning hantaviruses are periodically updated and made available on CDC's website, [All About Hantaviruses](#).

GUIDELINE AVAILABILITY

Electronic copies: Available from the Centers for Disease Control and Prevention (CDC) Web site:

- [HTML version](#)
- [Portable Document Format \(PDF\)](#)

Print copies: Available from the Centers for Disease Control and Prevention, MMWR, Atlanta, GA 30333. Additional copies can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9325; (202) 783-3238.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

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